

## **APPENDIX C**

### **Development Procedures for Wellfield Activities**

**(Includes Operator-Prepared Plans)**

**Attachment 1 – Transportation Plan**

**Attachment 2 – Reclamation Plan**

**Attachment 3 – Hazardous Materials Plan**

**Attachment 4 – Wildlife and Habitat Mitigation Plan**

## Development Procedures for Wellfield Activities

### 1.0 INTRODUCTION

These development procedures include plans prepared by Ultra Resources, Inc., Shell Exploration & Production Company, and Questar Market Resources including Operator committed mitigation. The plans include a Transportation Plan (Attachment 11), Reclamation Plan (Attachment 2), Hazardous Materials Summary (Attachment 3), and Wildlife and Habitat Mitigation Plan (Attachment 4).

### 2.0 DEVELOPMENT PROCEDURES

Drilling and development operations would continue year-round and may utilize as many as 48 drilling rigs operating in the PAPA. However, depending on the alternative selected, some areas would be restricted for winter drilling. Approximately 300 wells per year would be drilled in the PAPA during peak drilling.

#### Traffic and Workforce

The traffic volume in and out of the PAPA varies seasonally. During the development period (through 2023), traffic would be much greater in summer than in winter due to construction traffic required for construction of roads, pads and pipelines. Workers, material and equipment would be transported to the project area over U.S. Highways 191 and 189, State Highway 351, and county and BLM roads located within the PAPA. A comparison of traffic requirements for each of the alternatives for 2009 with and without the Shell and Ultra's liquid gathering system is provided in Table 1 below. A Transportation Plan is provided as Attachment 1.

**Table 1**  
**Comparison of Traffic (vehicles per day) During Development for all Alternatives in 2009**

	No Action Alternative			Proposed Action Alternative and Alternative C		
	Light	Heavy	Total	Light	Heavy	Total
Summer	1,959	1,034	2,993	622	595	1,217
w/o gathering	1,589	665	2,254	521	443	964

**Workforce Requirements.** Estimated workforce requirements to develop a single well in the PAPA are provided in Table 2.

**Table 2**  
**Workforce Requirements Necessary to Develop A Single Well in the PAPA**

Category	Average Number of Workers	Average Number of Days
Well Pad and Access Road Construction	15	5
Rig U/Down	15	5
Drilling	25	50
Testing and Completion	20	12

#### Preconstruction Planning and Site Layout

Pursuant to *Onshore Oil and Gas Order No. 1* and BLM regulation 42 *Code of Federal Regulations* (CFR) § 3162.3-1, each proposed well would require an Application for Permit to

Drill (APD) approved by BLM prior to any surface disturbance. Each APD includes site-specific information regarding all facets of well development, including environmental concerns. Operators and/or their contractors and subcontractors would be required to conduct all phases of project implementation (e.g., well pad construction, road and pipeline construction, drilling and completion operations, maintenance, reclamation, and abandonment) in full compliance with all applicable federal, state, and county plans, laws, and regulations and according to approved APD specifications, right-of-way (ROW) permits, and potentially site-specific environmental assessments (EAs) and decision records (DRs). Pursuant to section 390 of the Energy Policy Act of 2005, Pub. L. No. 109-58, § 390(b)(3), 119 Stat. 747-48 (2005), the BLM may exclude from NEPA documentation the approval of individual APDs within a developed field when a NEPA document has been prepared. Operators would be fully accountable for their contractors' and subcontractors' compliance with the requirements in the approved permits and/or plans.

When development of federal minerals would take place on private surface, Operators would follow *Onshore Oil and Gas Order No. 1* and CFR 43 Subpart 3814, if applicable, with regard to access for natural gas resource development and remuneration to the landowner for potential damage.

### Construction and Drilling Operations

All activities at each well in the PAPA would follow procedures approved by the BLM in the APD and attached Conditions of Approval (COAs). Well pad, access road, and other construction activities would follow guidelines set forth in the most recent edition of the "Gold Book," *Surface Operating Standards for Oil and Gas Exploration and Development*, and/or *Manual 9113 Roads* concerning road construction standards on projects subject to federal jurisdiction. Sufficient topsoil to facilitate revegetation would be segregated from subsoils during all construction and would be replaced on the surface upon completion of operations as part of the reclamation and revegetation program. Operators would employ appropriate topsoil storage technology and procedures to ensure soil viability and plant rooting potential are maintained. When topsoil piles exceed 3 feet in height or will be stored for 2 years or longer, Operators would develop a plan for BLM approval that details methods and/or procedures to maintain or replace soil microbial and nutrient viability for reclamation.

### Well Pads

Major components of each individual well pad include the following:

- a level drilling area for placement and support of the drilling rig and related equipment, production facilities, and storage tanks;
- if approved, an earthen reserve pit to contain drilling fluids, drilled cuttings, and fluids produced during the drilling operation; and
- an earthen flare pit for the safe ignition of flammable gases produced during permitted completion and testing operations.

The entire well pad area would be cleared of all vegetation, and up to 12 inches of topsoil would be removed from all cut, fill, and/or subsoil storage areas. Topsoil would be stockpiled for future use in reclamation. After the topsoil has been removed, the pad would be graded to prepare a level working surface. Each well location would be designed so that the amount of cut and fill material would "balance," where feasible, thereby minimizing the need to stockpile excess subsoil adjacent to the well location until site reclamation. Materials excavated from the reserve

pit (if such pit is approved) would be stockpiled adjacent to the reserve pit and used to backfill the pit during reclamation.

The area required for drilling and completion of each well would vary depending upon the total number of wells to be developed from the pad, and whether new development would occur from an existing pad. In general, single well pads would require 5 to 10-acre pads, and directional well pads with multiple wells would require from 6 to 28 acres.

Erosion control would be maintained through prompt revegetation and by constructing surface water drainage controls such as berms, diversion ditches, and sediment ponds as necessary at each well location. All diversion ditches and other surface water and erosion control structures at each location would be shown on topographic relief maps provided with each APD. Storm Water Pollution Prevention Plans (SWPPPs) would be prepared by each Operator for all wells, access roads, and other disturbances of more than 1 acre, in compliance with the Wyoming Department of Environmental Quality (WDEQ) Water Quality Division requirements.

### Roads

New resource road construction would average approximately 0.44 mile for each new well pad. With the inclusion of an adjacent gathering pipeline, 5.35 acres of disturbance would be required initially (100-foot initial disturbance width) and 1.89 acres of disturbance would be required for the LOP (35-foot LOP disturbance width).

Roads would be designed by a licensed professional engineer if deemed necessary by the BLM (i.e., in problem areas such as steep slopes, unsuitable soils), and all roads would be built in accordance with guidelines established for oil and gas exploration and development activities in *BLM Manual* Section 9113. On completion of construction activities, the engineer would certify that the road was constructed in accordance with the approved road construction design, if deemed necessary by the BLM. Any deficiencies would be corrected to ensure compliance with both the approved Road Construction Plan and the APD. Once resource road construction is complete, all but 35 feet of the ROW (road surface area and portions of borrow ditch) would be reclaimed and revegetated.

Aggregates used for road and well location construction would be acquired from commercial sources in and adjacent to the PAPA. Prior to aggregate extraction, appropriate permits would be obtained from the BLM and/or WDEQ/Land Quality Division (LQD) and WDEQ/Air Quality Division (AQD), as appropriate. Aggregates would be free of noxious weeds.

### Drilling Operations

Up to 48 drilling rigs rated for drilling to depths of 14,000 feet or more may be employed simultaneously during project development to accommodate development of approximately 300 wells per year. All drilling operations and other well site activities would be conducted in compliance with applicable BLM, Wyoming Oil and Gas Conservation Commission (WOGCC), WDEQ, and other federal, state, and county rules and regulations. Including rig-up and rig-down activities, drilling each well would take an average of approximately 50 days.

Directional drilling provides for the construction of a single well pad that may accommodate as many as 32 wells (consolidated well pad). The initial and LOP disturbance required for each consolidated well pad is increased over that for a pad with a single well, however, there are fewer total pads for a given number of wells. Consolidated well pads may be serviced by one

access road and gathering system pipeline, as well as a single separation, dehydration, and storage facility. Where new directional wells are developed at an existing well site, separate separation, dehydration, and storage facilities may be used.

Drilling operations would utilize either water-based or oil based mud system or both, with additives to minimize downhole problems. The quantity of water used in drilling and completion varies between Operator because of mud type, and the re-use of partially treated produced water in drill-out and fracturing. If water based mud is used throughout the hole and there is no re-use of produced water, as much as 40,000 bbl Wasatch well water may be required per gas well. Use of oil-based mud in drillout below casing and re-use of produced water in completions can reduce that requirement to less than 5,000 bbl per gas well. There are currently approximately 98 water supply wells in the PAPA, but it is proposed that each new consolidated well pad would have its own water supply well to avoid haulage and piping. Because they are located on drilling pads, new water supply wells would require no additional disturbance. The All water well would be permitted with the Wyoming State Engineer's Office (WSEO).

Water might still be trucked or piped to some well pads from water wells and/or treatment facilities depending on site-specific conditions, disturbance requirements, and time of year. Water pipelines would be temporary and would consist of either standard 3-to 6-inch diameter aluminum sections or polypipe. These water pipelines would be laid on the ground surface within road ROWs or directly overland and would be removed after completion/testing operations are done.

Operators would utilize closed drilling systems (no reserve pits) for well locations where certain environmental conditions exist (e.g. high water table). If reserve pits are approved, Operators would remove/vacuum fluids from reserve pits within 1 year of all wells on the pad being put into production. If this timeframe is infeasible on a particular site, the Operators would notify the WOGCC or BLM and fluids would be removed as soon as practical. If oil-based fluids are used, they would be recovered in tanks. If any oil enters reserve pits, it would be removed pursuant to WOGCC rules and regulations and the pit would be flagged overhead or covered with netting to prevent waterfowl use in compliance with BLM Informational Bulletin Number WY-93-054.

Surface casing is typically set to approximately 2,500 feet to isolate shallow water zones (alluvium and Wasatch). After drilling out each well and logging it, production casing is run and cemented to at least 400 feet above the Lance Formation, effectively isolating all geologic formations and eliminating fluid migration between hydrocarbon-bearing zones and freshwater aquifers.

### Completion Operations

Once the well has been drilled and cased, completion operations would begin to clean the wellbore, to conduct pressure testing, and to perforate potentially productive zones. A bond log would be run (a bond log tests the integrity of the cement bond between the casing and the borehole is verified), casing would be perforated in potentially productive zones downhole (e.g., Lance Pool sand lenses), and production tubing run. Multiple sand lenses would be fracture-stimulated. Fracture-stimulation (fracturing) is the process by which fluids and proppants (typically water or nitrogen foam with sand) are pumped downhole under pressure through the casing perforations and into the formation. As the formation is fractured by applied pressure, the fractures are filled with sand to prop them open, so that they facilitate the flow of gas into the well.

Upon completion of fracturing, the well is flowed back to the surface to recover as much of the fracture fluid as possible and to clean excess sand out of the perforations. Production tubing might be permanently set, if warranted.

All fracture fluid additives would meet BLM and/or EPA requirements for disposal of oil field wastes. All fluids utilized in the completion procedure would be contained on the well pad in pits or tanks and disposed of in compliance with state and federal rules and regulations. In the past, gases and condensate produced in association with completion and testing were flared, but this project will employ “green completions” as required by WDEQ, Air Quality Division flaring permits for the operators in the Pinedale Anticline. To minimize the need for flaring, a high-pressure multiphase flow-back separation unit designed to separate sand, condensate, natural gas, and water would be used. Sand would be piped to a steel pit (if such pit is approved), water would be captured in a flow-back tank, and gas and condensate would be piped to the production units. This process would result in the capture and sale of at least 90 percent of the gas and condensate per well that would otherwise have been lost during flowback. Gathering pipelines must be installed prior to the use of flareless completions, and the gas must be suitable for delivery into an interstate sales pipeline; if it is not suitable, then some flaring may still be required.

If reserve pits are approved, Operators would remove/vacuum fluids from reserve pits within 1 year of all wells on the pad being put into production. If this timeframe is infeasible on a particular site, the Operators would notify the WOGCC or BLM and fluids would be removed as soon as practical. Off-lease disposal of fluids would be in strict accordance with all appropriate rules and regulations regarding the discharge, transport, and/or disposal of such fluids.

Interim reclamation of disturbed areas not needed for production would occur as specified in APDs. Up to 60 percent of the disturbed acres would be reclaimed during interim reclamation. After well completion, production equipment would be set, gathering pipelines installed, and the well placed on line, with production continuing as long as the well is capable of commercial production and a demand for the gas exists. Production equipment typically would include a “Christmas tree” at the wellhead (a series of valves designed to control pressures and regulate flows from the well); separators to segregate natural gas, condensate, and water; aboveground tanks for condensate and produced water storage with emission control devices to lower volatile organic compounds (VOCs) where required by WDEQ; a methanol tank and pump; a glycol dehydrator, with emission control devices to lower VOCs and hazardous air pollutants (HAPs) and pump; and a meter run for measurement of gas volumes produced into the pipeline. More or larger tanks would be required at multiple well pads. As gas production declines from wells, so does condensate and water production, and, over time, condensate and water tanks may be removed from well pads or smaller tanks may be substituted to accommodate reduced storage requirements for condensate and produced water.

All aboveground production facilities would be painted a standard environmental color that blends with the surrounding landscape, except for structures that require safety coloration to comply with Occupational Safety and Health Administration (OSHA) regulations.

#### Shell and Ultra Liquid Gathering System

Shell and Ultra plan to install liquids gathering systems to collect condensate and water from existing and future well pads. The piping right-of-way disturbance would be a short-term impact during piping construction and burial. Following installation of the piping, reclamation and seeding of right-of-ways would take place to restore the disturbed areas to a native state.

The liquids gathering system would require approximately 640-miles of piping to be installed by Shell and Ultra, or by 3rd party gatherer(s). However, sharing of right-of-ways has been considered in an effort to minimize surface disturbance, resulting in an assessment of 250-miles of net disturbance for liquids gathering system right-of-ways.

The liquids gathering systems would also require facilities for transporting, treating, and storing the collected liquids. These facilities will consist of central gathering facilities, which will include components such as: pumps, compressors, pressure vessels, tanks, liquids treating equipment, sales metering, and associated utilities systems necessary to provide power, heat, and other process needs.

Secondary pipelines would be necessary to transport the processed liquids from the central gathering facilities. These pipelines will be for condensate, water recycling and disposal, and for gas recovered from the facilities. Again, the sharing of right-of-ways has been considered in an effort to minimize surface disturbance associated with these secondary lines.

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## **Attachment 1**

### **Transportation Plan**

Prepared by

Ultra Resources, Inc.  
Shell Exploration & Production Company  
Questar Market Resources



## Transportation Plan

### Purpose

Questar Market Resources (Questar), Shell Exploration & Production Company (Shell), and Ultra Resources, Inc. (Ultra), hereinafter collectively referred to as “Proponents”, propose this Transportation Plan to supplement the 2000 PAPA ROD Transportation Plan (TP 2000) as provided below.

The purpose of this plan is to incorporate measures that: 1) reduce surface use to maintain habitat function and minimize habitat fragmentation; 2) reduce human activity to lessen disturbance to wildlife and reduce impacts to community, county and state infrastructure; and, 3) reduce air emissions through consolidation of locations and associated development and production activities.

Proponents propose to accomplish these goals through reduction of the number of pads through multi-well pad development, directional drilling, and simultaneous operations; concentration of pad locations into three operation areas; reduction of rig moves on and off pads; use of liquids gathering systems and centralized facilities where feasible to reduce truck traffic and the number of production tanks and associated VOC's; management of traffic through busing and scheduling during seasonal stipulation periods; and the increased use of computer assisted operations (CAO) reducing trips and traffic during production. Proponents' proposal will also result in a decrease of the expected period for development in concentrated areas under seasonal restrictions by up to 50 percent.

### Scope

This plan applies to roads and the transportation of gas, condensate, or water via pipelines and as outlined in the TP 2000. The plan includes assumptions, mitigation measures, and guidelines. Relevant requirements for road construction or reconstruction and the development of agreements for surface use, rights-of-ways (ROW), and maintenance will be addressed and quantified in the Technical Support Document (TSD) submitted to BLM within 1 year of the release of the SEIS ROD and will be updated annually.

Pipelines / flowlines will be installed either within the road easement and / or within existing pipeline corridors to the extent feasible. Pipelines generally will be located adjacent to roads to reduce new surface disturbance. In instances where paralleling roads and lines lead to increased environmental and / or safety impacts, pipelines may be located along alternative routes. These alternative routes will be evaluated and sited to minimize environmental impacts.

Multi-well pads utilizing directional drilling may accommodate use of multiple drilling rigs operating year round as well as simultaneous drilling, completion, construction, and production operations. Concentrating operational activity into specific multi-section areas will lessen road development PAPA-wide during a given time period leaving large blocks of undeveloped acreage available to wildlife and livestock.

**Proponent Committed Measures**

1. Proponents will use public and existing roads as much as possible to lessen new surface disturbance and habitat fragmentation. New road construction under the concentrated development, multi-well pad proposal would be reduced by at least 70% PAPA-wide as compared to non-concentrated, single-well pad development. Per section, this equates to up to 1.16 miles or about 12 acres (roadway, flowline easement).
2. When siting new roads, Proponents will work with the Bureau of Land Management (BLM) to ensure this is done in the most efficient and environmental effective way. Proponents will continue use and development of ROW Surface Use Plans.
3. Annual road planning, development, maintenance, and other issues and concerns will be incorporated into a Technical Support Document (TSD), as will detailed information (including maps) on existing roads/routes and natural obstacles. The TSD and associated maps, as well as proposed project activities; operator construction and maintenance responsibilities; and road-specific dust abatement, construction, and surfacing requirements, will be updated annually or as necessary and submitted to the BLM.
4. Proponents will not move drill rigs to and from well pads in crucial big game winter range after November 15 and before May 1 outside of the agreed upon concentrated activity areas. Rigs within the concentrated areas will normally move onto a pad and stay until all scheduled wells for that rig are drilled as feasible. Delineation wells as discussed in Chapter 2 will be determined in the annual plans in consultation with BLM and WG&FD.
5. Proponents will deliver and store equipment and bulk supplies on or near the well pads prior to seasonal stipulation periods to the maximum extent feasible to reduce traffic and human disturbance on wildlife.
6. Proponents are committed to utilizing liquids gathering systems and centralized facilities where feasible. After the construction phase and where appropriate, liquids gathering systems and centralized facilities will significantly reduce tanker truck traffic by up to 475 truck trips per day during peak production.
7. Between November 15 and April 30 in a given year in crucial big game winter range and sage grouse winter concentration areas, Proponents will make reasonable effort to bus rig crews from appropriate vehicle staging areas to minimize commuting traffic. Proponents will not tolerate workers who miss the bus and drive personal vehicles to the pads during this time period.
8. Proponents will each coordinate the transportation routes and scheduling of service contractors to minimize the amount of traffic associated with year round development.
9. Proponents will fund hosted workers to the BLM Pinedale Office to operate an access station from November 15 through April 30 each year to monitor essential traffic to the pads. Proponents will determine in consultation with BLM how long the access station will be in place. Hosted workers would report to the BLM Pinedale Field Office. Traffic data would be compiled to differentiate between essential activity and non-essential traffic. Proponents would use this information to adjust their practices, if needed, to

reduce traffic. The access station would be open 24 hours a day, seven days a week. Proponents would fund signage appropriate to inform the public and industry of the access station and travel restrictions.

10. Where feasible, Proponents will utilize computer assisted remote monitoring of producing wells to reduce the need for daily site visits during the production phase.
11. Proponents will reclaim any road not required for routine operation and maintenance of producing wells or ancillary facilities as directed by the BLM, State Land Board, or private landowner. These roads would be blocked, recontoured, reclaimed, and revegetated by Proponents, as would disturbed areas associated with permanently abandoned pads.
12. As part of normal operational winter maintenance, Proponents will plow roads the minimum amount necessary to allow safe navigation. Plows would provide breaks in snow piled berms along the road margins (knockouts) in order to allow free movement of wildlife across roads.
13. Proponents will advise personally and/or by mail to all project-related personnel and vendors traffic activity restrictions and rules of conduct while on the PAPA. These will include, but are not limited to,
  - a. No stopping to observe wildlife
  - b. No harassment of wildlife
  - c. No firearms
  - d. No pets outside a vehicle
14. Proponents will provide a laminated sheet entitled "Code of Conduct during Seasonal Stipulation Periods" that will be required to be carried in each company vehicle. The sheets will also provide instruction on the types of human activity that create stress in wildlife.
15. Proponents would observe speed limits within the PAPA and will encourage service contractors and vendors to do the same. This will be included in the "Code of Conduct during Seasonal Stipulation Periods".
16. Proponents will implement voluntary fugitive dust control measures on primary access roads and heavily used resource roads.
17. Proponents will instruct personnel on behaviors appropriate for minimizing disturbance to wildlife consistent with current documents on such conduct and developed in consultation with BLM, WG&FD or other wildlife experts.
18. In consultation with BLM and WG&FD, Proponents will install gates as appropriate and supply other needed material in crucial winter range and sage grouse concentration areas to encourage compliance with traffic restrictions. After construction, the BLM would maintain the gates. Gate keys would be managed by the BLM. Gate closures would be consistent with traffic restrictions. Proponents would assist BLM with signage on or near the gate explaining the traffic restrictions.

### Estimated Traffic Volumes – Drilling

Following are the anticipated traffic and activity associated with drilling in a concentrated area on a consolidated multi-well pad:

1. Each rig will have the following personnel on location 24 hours per day. Each person will have a vehicle, but would typically not leave location on most days.
  - a. Drilling Foreman
  - b. Toolpusher
  - c. Mud Engineer
  - d. Directional Driller, when needed
  - e. MWD Technician, when needed
  - f. Mud Logger
  - g. Top Drive Operator
2. Each rig will typically have two six-man crews, each working a 12-hour shift. Shift changes are generally at 6:00 a.m. and 6:00 p.m.
3. Rig traffic. The estimated traffic required for each well for the 45 to 55 days it takes to drill the well has been estimated as follows:
  - a. Fuel Tankers – 17
  - b. General Hauling – 88
  - c. Mud and Waste Haulers – 44
  - d. Water Trucks – 49, unless on-site water wells are permitted
  - e. Down hole tool delivery and Misc. Supplies – 70
  - f. Construction, management, roustabouts and services – 284
  - g. Cement, barite, and mud chemicals – 48
  - h. Rig moves on / off pad – 70
  - i. Skids – 6

This traffic estimate includes approximately 299 roundtrips by heavy trucks and 301 roundtrips by pickup truck or autos per well excluding the rig moves on / off pad and skids. The trip total reflects a decrease in supply traffic on multi-well pads at approximately 33 percent less than normal traffic to single wells on separate pads.

### Estimated Traffic Volumes – Completions

Following are the anticipated traffic and activity associated with completions in a concentrated area on a consolidated multi-well pad. Estimates are per well and will be reduced with concurrent multiple well completions.

a. Proppant Hauling	53
b. Frac Fleet    Semi Transport	40
Light Trucks	53
c. Water    Delivery	35
Hauling	130
d. Wireline- Perforating and Logging	10
e. Coiled Tubing Drillout	28
f. Other semis/transport	19
g. Other light truck/pickup	120
TOTAL	488

**Estimated Traffic Volumes – Production**

Where feasible, upon gathering systems being fully operational and in combination with computer assisted operations being utilized, Proponents anticipate 1 roundtrip per day associated with pad production.

**Estimated Traffic Volumes – Pad and Road Construction**

Proponents expect to construct / expand pads and roads primarily outside of winter conditions.

Anticipated traffic to construct / expand one pad is 708 roundtrips which include heavy and light trucks, dump trucks, and water trucks.

Anticipated traffic to construct one access road is 146 roundtrips which include heavy and light trucks, dump trucks, and water trucks.

**Emergency Vehicle Traffic Volumes**

Emergency vehicle traffic for emergencies cannot be predicted or quantified, but are noted they will occur even as Proponents continue to enhance the safety of their contractors, service providers, and themselves in their operations.

## **Attachment 2**

### **Reclamation Plan**

Prepared by

Ultra Resources, Inc.  
Shell Exploration & Production Company  
Questar Market Resources

## **Reclamation Plan**

### **Purpose**

Questar Market Resources (Questar), Shell Exploration & Production Company (Shell), and Ultra Resources, Inc. (Ultra), hereinafter collectively referred to as “Proponents”, propose this reclamation plan to supplement the 2000 PAPA ROD reclamation components as provided below.

A high priority of the Proponents is to limit surface disturbance through multiple-well pads, interim reclamation, directional drilling and consolidated development. Use of these multiple-well pads will correspondingly reduce associated development impacts such as roads and pipelines. By concentrating pad locations and operational activities, Proponents will leave large blocks of acreage undisturbed and available for wildlife and livestock use.

The purpose of this plan is to incorporate measures which will support the return of as much of the disturbed acreage to its pre-disturbed state as quickly as feasible upon conclusion of drilling and completion operations from a given surface pad.

### **Scope**

This plan applies to practices within the PAPA to protect vegetation and to ensure proper and timely restoration of disturbed areas to approximate pre-disturbance levels. Monitoring of reclaimed areas and pilot / demonstration reclamation plots will be done to assure successful reclamation occurs.

The Standard Practices as to soils and vegetation which are specified in the 2000 PAPA ROD page 20 – 21 and in Appendix A, pages A-2, A-12 - 15, and A-27 - 30 should be incorporated into the SEIS. In addition, as stated in Appendix A, page A-14, “BLM will continue to allow applicants to use their own expertise in recommending and implementing construction and reclamation projects,” thus permitting new methods and application practices to be implemented to accelerate and improve revegetation.

### **Proponent Committed Measures to Lessen Disturbance and the Need for Reclamation**

1. The proposed concentrated development, multiple-well pad plan will reduce overall vegetation disturbance by 48 percent over development envisioned under the 2000 PAPA ROD, a significant benefit to wildlife and livestock.
2. Proponents will use public and existing roads as much as possible to lessen new surface disturbance and habitat fragmentation. By using multiple-well pads, proponents will be able to eliminate up to 1.16 miles or about 12 acres of roadway and flowline easement per section.
3. Proponents will use existing pads to the extent feasible for infill development to reduce the need for new pads and lessen new surface disturbance.

**Proponent Committed Measures for Reclamation**

1. Proponents will return as much of the disturbed acreage as possible to its pre-disturbed state as quickly as possible. Final revegetation will begin when the last of the wells on the pad is completed. Drilling and completing all wells on a pad sequentially results in earlier final revegetation and a smaller disturbed area. Proponents propose to use a variety of options and methods, such as the new habitat seed mixture of grasses, shrubs, and forbs and new application method which is in its second year of demonstration. This expedited reclamation will increase habitat patch sizes and reduce habitat fragmentation for sagebrush-obligate species. Proponents estimate that on the larger consolidated pads, approximately 70% of the pad will be reclaimed if pits were on the pad. If there are no reserve pits, the surface disturbance area is smaller and about 50% of that smaller pad would be reclaimed.
2. Proponents will utilize interim reclamation, where reasonable, to return as much of the landscape as possible to a condition usable by wildlife and livestock as quickly as possible. Interim reclamation will increase habitat patch sizes and reduce habitat fragmentation for sagebrush-obligate species.
3. Proponents will continue to monitor reclaimed areas and will encourage review of the monitoring data by BLM, Wyoming Game and Fish Department, and Wyoming Department of Agriculture habitat experts.
4. Proponents will adapt reclamation practices as appropriate based upon monitoring information. Successful reclamation to maintain soil stability and provide habitat function will be measured in stages, as follows:
  - a. The establishment of a viable seedling cover within 1 year of initiation of reclamation. Viable seedling cover shall consist of indigenous species and/or ecologically-comparable species as approved by BLM habitat experts;
  - b. Within 5 years of initiation of reclamation, the operator will establish at least 50% of indigenous vegetative cover and species composition; and,
  - c. Within 8 years of initiation of reclamation establish at least 80% of indigenous vegetative cover and species composition.
5. The initiation of reclamation will commence immediately after the last well scheduled on a pad is put into production, as weather permits. In the event that more than two years will lapse between the drilling and / or completion of wells on a pad, the BLM may require interim reclamation and / or temporary site stabilization measures.
6. Proponents will test and implement, as appropriate, new methods of reclamation, seed mixtures, and application practices to accelerate and improve the revegetation in consultation with BLM and WGFD.



**ATTACHMENT 3**

**Hazardous Materials Summary**

Prepared by

Ultra Resources, Inc.  
Shell Exploration & Production Company  
Questar Market Resources

## **Hazardous Materials Plan Pinedale Anticline Year Round Access SEIS**

### **PURPOSE**

Ultra Resources, Inc. (Ultra), Shell Exploration & Production Company (Shell) and Questar Market Resources (Questar), hereinafter collectively referred to as "Proponents," propose this Hazardous Materials Plan to supplement the 2000 Record of Decision on the Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming (2000 PAPA ROD) as provided below.

The purpose of the Hazardous Materials Plan is to protect public and worker health and safety and support the Bureau of Land Management's (BLM's) inspection and enforcement capability.

### **SCOPE**

This plan applies to construction, development and production practices within the Pinedale Anticline Project Area (PAPA) applicable to handling, storage and disposal of hazardous materials.

### **PROPONENTS' COMMITTED MEASURES**

1. Each individual Proponent would be responsible for ensuring that all production, use, storage, transport and disposal of hazardous and extremely hazardous materials used or produced in their respective operations as a result of the proposed project would be in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines.
2. Each individual Proponent would be responsible for communication and/or training for its employees, visitors on a site and requirements of subcontractor programs in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines.
3. Each individual Proponent would be responsible for maintaining chemical and hazardous materials records and distributing such records to appropriate entities in compliance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines
4. A release of a hazardous substance, such as a leak or spill, in excess of the reportable quantity as established by 40 CFR Part 117.3, would be reported by each individual Proponent as required by the Comprehensive Environmental Response, Compensation, and Liability Act, Section 102 B.
5. If toxic substances are necessary, their usage would comply with provisions of the Toxic Substances Control Act of 1976, as amended (40 CFR Part 702-799).
6. Each individual Proponent would adhere to internal Hazard Waste Management policies and procedures.

## HAZARDOUS MATERIALS MANAGEMENT SUMMARY

This Hazardous Materials Management Summary is provided pursuant to BLM instruction memoranda which require that all National Environmental Policy Act (NEPA) documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported or disposed of as a result of a proposed project.

Materials are considered hazardous if they contain chemicals or substances listed in the Environmental Protection Agency's (EPA's) Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). Extremely hazardous materials are those identified in the EPA's List of Extremely Hazardous Substances (*40 Code of Federal Regulations* [CFR] 355).

Proponents have reviewed the EPA's Consolidated List of Chemicals Subject to Reporting Under Title III of SARA (as amended) to identify any hazardous substances proposed for production, use, storage, transport or disposal by this project, as well as EPA's List of Extremely Hazardous Substances as defined in 40 CFR 355 (as amended) and have determined that various materials listed as hazardous and/or extremely hazardous would be used or generated by this project. All known hazardous and extremely hazardous materials potentially produced, used, stored, transported and/or disposed of as a result of the project are presented in the table below.

Materials anticipated to be used or produced during implementation of the proposed project generally can be included in the following categories: drilling materials, cementing and plugging materials, fracturing materials, production products, fuels, pipeline materials, emissions, compressor station/centralized processing, wellhead processing and storage facility materials and miscellaneous materials.

### GENERIC LIST OF MATERIALS, HAZARDOUS MATERIALS AND HAZARDOUS AND EXTREMELY HAZARDOUS MATERIALS POTENTIALLY UTILIZED OR PRODUCED DURING CONSTRUCTION, DRILLING, PRODUCTION AND RECLAMATION OPERATIONS

All materials in the following list are dependent on quantity used for determination of hazardous and/or extremely hazardous status. The following materials, dependent on the amount used, are listed as potentially hazardous and extremely hazardous materials.

This is a generic list of materials that were contained in the March 2006 Record of Decision for the Jonah Infill Drilling Project Environmental Impact Statement and in the July 2000 Record of Decision for the Pinedale Anticline Oil and Gas Exploration and Development Project Sublette County, Wyoming Environmental Impact Statement. These materials may be used during operations but not always and not by each operator.

Materials	Hazardous Substances <sup>1</sup>	Extremely Hazardous Substances <sup>2</sup>
<b>Drilling Materials</b>		
Anionic polyacrylamide		Acrylamide
Barite	Barium compounds Fine mineral fibers	
Bentonite	Fine mineral fibers	
Caustic soda	Sodium hydroxide	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Glutaraldehyde	Isopropyl alcohol	
Lime	Calcium hydroxide	
Mica	Fine mineral fibers	
Modified tannin	Ferrous sulfate Fine mineral fibers	
Phosphate esters	Methanol	
Polyacrylamides	Petroleum distillates	Acrylamide
Polyanionic cellulose	Fine mineral fibers	
Retarder	Fine mineral fibers	
<b>Cementing and Plugging Materials</b>		
Bentonite	Fine mineral fibers	
Anti-foamer	Glycol ethers	
Calcium chloride flake	Fine mineral fibers	
Cellophane flake	Fine mineral fibers	
Cements	Aluminum oxide Fine mineral fibers	
Chemical wash	Ammonium hydroxide Glycol ethers	
Diatomaceous earth	Fine mineral fibers	
Extenders	Aluminum oxide Fine mineral fibers	
Fluid loss additive	Fine mineral fibers Naphthalene	Acrylamide
Friction reducer	Fine mineral fibers Naphthalene PAHs POM	
Mud flash	Fine mineral fibers	
Retarder	Fine mineral fibers	
Salt	Fine mineral fibers	
Silica flour	Fine mineral fibers	
<b>Fracturing Materials</b>		
Biocides	Fine mineral fibers PAHs POM	
Breakers	Ammonium persulphate Ammonium sulphate Copper compounds Ethylene glycol Fine mineral fibers Glycol ethers	
Clay stabilizer	Fine mineral fibers Glycol ethers Isopropyl alcohol Methanol PAHs POM	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Crosslinkers	Ammonium chloride Methanol Potassium hydroxide Zirconium nitrate Zirconium sulfate	
Foaming agent	Glycol ethers	
Gelling agent	Benzene Ethylbenzene Methyl tert-butyl ether Naphthalene PAHs POM Sodium hydroxide Toluene m-Xylene o-Xylene p-Xylene	
pH buffers	Acetic acid Benzoic acid Fumaric acid Hydrochloric acid Sodium hydroxide	
Sands	Fine mineral fibers	
Solvents	Glycol ethers	
Surfactants	Glycol ethers Isopropyl alcohol Methanol PAHs POM	
<b>Production Products</b>		
Liquid hydrocarbons	Benzene Ethyl benzene n-Hexane PAHs POM Toluene m-Xylene o-Xylene p-Xylene	
Natural gas	n-Hexane PAHs POM	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Produced water/cuttings	Arsenic Barium Cadmium Chromium Lead Manganese Mercury Radium 226 Selenium Uranium Other radionuclides	
<b>Fuels</b>		
Diesel fuel	Benzene Cumene Ethylbenzene Methyl tert-butyl ether Naphthalene PAHs POM Toluene m-Xylene o-Xylene p-Xylene	
Gasoline	Benzene Cumene Cyclohexane Ethylbenzene n-Hexane Methyl tert-butyl ether Naphthalene PAHs POM Toluene m-Xylene o-Xylene p-Xylene	
Natural gas	n-Hexane PAHs POM	
Propane	Propylene	
<b>Pipeline Materials</b>		
Coating	Aluminum oxide	
Cupric sulfate solution	Cupric sulfate Sulfuric acid	
Diethanolamine	Diethanolamine	
LP Gas	Benzene n-Hexane Propylene	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Molecular sieves	Aluminum oxide	
Pipeline primer	Naphthalene Toluene	
Potassium hydroxide solution	Potassium hydroxide	
Rubber resin coatings	Acetone Coal tar pitch Ethyl acetate Methyl ethyl ketone Toluene Xylene	
<b>Emissions</b>		
Gases	Formaldehyde	Nitrogen dioxide Ozone Sulfur dioxide Sulfur trioxide
Hydrocarbons	Benzene Ethylbenzene n-Hexane PAHs Toluene m-Xylene o-Xylene p-Xylene	
Particulate matter	Barium Cadmium Copper Fine mineral fibers Lead Manganese Nickel POM Zinc	
Coolants	Ethylene glycol	
Crude Oil	Benzene PAHs POM	
Grease	Zinc compounds	
Heat Transfer Fluid	Benzene	
Lubricants	1,2,4-trimethylbenzene Barium Cadmium Copper n-Hexane Lead Manganese Nickel PAHs POM Zinc	
Methanol	Methanol	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Marking Paints	Hexane Naphthalene Toluene Xylene Acetone Cyclohexane	
Primers	Acetone Methanol Methyl Ethyl Ketone Naphthalene Toluene Xylene Zinc	
Plant Condensate	Benzene Ethyl benzene n-Hexane PAHs POM Toluene m-Xylene o-Xylene p-Xylene	
Silicone Seal	Silane	
<b>Miscellaneous Materials</b>		
Acids	Acetic anhydride Formic acid Sodium chromate Sulfuric acid	
Antifreeze, heat control, and dehydration agents	Acrolein Cupric sulfate Ethylene glycol Freon Phosphoric acid Potassium hydroxide Sodium hydroxide Triethylene glycol Polyethylene glycol	
Batteries	Cadmium Cadmium oxide Lead Nickel hydroxide Potassium hydroxide Sulfuric acid	
Biocides	Formaldehyde Isopropyl alcohol Methanol	
Cleaners	Hydrochloric acid	



<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Corrosion inhibitors	4-4' methylene dianiline Acetic acid Ammonium bisulfite Basic zinc carbonate Diethylamine Dodecylbenzenesulfonic acid Ethylene glycol Isobutyl alcohol Isopropyl alcohol Methanol Naphthalene Sodium nitrite Toluene Xylene	
Emulsion breakers	Acetic acid Acetone Ammonium chloride Benzoic acid Isopropyl alcohol Methanol Naphthalene Toluene Xylene Zinc chloride	
Fertilizers	Unk	
Herbicides	Unk	
Lead-free thread compound	Copper Zinc	
Lubricants	1,2,4-trimethylbenzene Barium Cadmium Copper n-Hexane Lead Manganese Nickel PAHs POM Zinc	
Methanol	Methanol	
Motor oil	Zinc compounds	

<b>Materials</b>	<b>Hazardous Substances <sup>1</sup></b>	<b>Extremely Hazardous Substances <sup>2</sup></b>
Paints	Aluminum Barium n-Butyl alcohol Cobalt Lead Manganese PAHs POM Sulfuric acid Toluene Triethylamine Xylene	
Paraffin control	Carbon disulfide Ethylbenzene Methanol Toluene Xylene	
Photoreceptors	Selenium	
Scale inhibitors	Acetic acid Ethylene diamine tetra Ethylene glycol Formaldehyde Hydrochloric acid Isopropyl alcohol Methanol Nitrilotriacetic acid	
Sealants	1,1,1-trichloroethane n-Hexane PAHs POM	
Solvents	1,1,1-trichloroethane Acetone t-Butyl alcohol Carbontetrachloride Isopropyl alcohol Methyl ethyl ketone Methanol PAHs POM Toluene Xylene	
Starting fluid	Ethyl ether	
Surfactants	Ethylene diamine Isopropyl alcohol Petroleum naphtha	
<sup>1</sup> Hazardous substances are those constituents listed under the Consolidated List of Chemicals Subject to Reporting Under Title III of the <i>Superfund Amendments and Reauthorization Act of 1986 (SARA)</i> , as amended. <sup>2</sup> Extremely hazardous substances are those defined in 40 CFR 355.		

## **ATTACHMENT 4**

### **Wildlife and Habitat Mitigation Plan**

Prepared by

Ultra Resources, Inc.  
Shell Exploration & Production Company  
Questar Market Resources

## WILDLIFE AND HABITAT MITIGATION PLAN

### Purpose

Ultra Resources, Inc. (Ultra), Shell Exploration & Production Company (Shell), and Questar Market Resources (Questar), collectively referred to as the “Proponents”, propose this wildlife and habitat mitigation plan to supplement wildlife and habitat provisions identified in the 2000 Pinedale Anticline Exploration and Development Project Record of Decision (ROD) (Bureau of Land Management [BLM] 2000).

On December 6, 2004, the Wyoming Game and Fish Department (WGFD) issued the guidance document Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats (WY Game & Fish Department. 2004 Cheyenne, WY). This document recommends various mitigation and management practices to address impacts to wildlife which could be employed by oil and gas industry in the development of oil and gas resources in Wyoming. In addition to its recommended standard management practices to reduce wildlife impacts associated with oil and gas development, the WGFD also recommended additional mitigation/management prescriptions including: directional drilling, clustered development, condensate removal, remote monitoring, travel plans, environmental monitoring, and as appropriate, gate and close all newly constructed roads to public travel. The following Proponent commitments have incorporated not only most of the recommended standard management practices, but all of the recommended additional mitigation/management prescriptions.

The Proponents’ development proposal limits surface fragmentation through directional drilling, multiple-well pads, interim reclamation and consolidated development areas. Use of these multiple-well pads within consolidated development areas will correspondingly reduce associated development impacts such as roads and pipelines. In addition, the Proponents will substantially reduce the amount of human activity and on-site facilities through the use of liquids gathering systems and consolidated production facilities which will result in decreased surface disturbance. By concentrating pad locations and operational activities, Proponents will leave large blocks of acreage undisturbed and available for wildlife use.

### Scope

This plan applies to practices within the Pinedale Anticline Project Area (PAPA) to ensure avoidance and minimization of impacts to wildlife and wildlife habitat and to ensure in the event that avoidance and minimization are unachievable, the proper and timely mitigation of wildlife and habitat impacts both on-site and off-site, if needed.

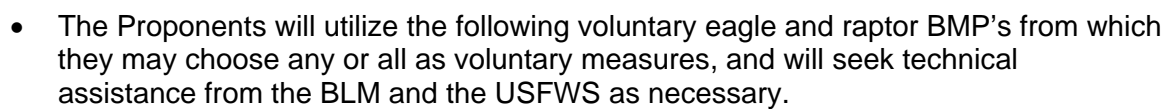
This Plan amends the 2000 PAPA ROD and Mitigation Guidelines and Standard Practices, Appendix A, as they apply to big game and sage grouse except for surface occupancy within 0.25 mile of an active lek. Proponents are requesting waivers of existing stipulations for big game and sage grouse during wintering, nesting, and brood rearing periods within the concentrated development areas (CDA) for construction and development activities. This will allow for year round construction and development activities within these CDA’s during the multi-year period required to complete these actions thereby substantially reducing the time required for the project development phase. A 0.25-mile restriction of no surface occupancy of permanent facilities near active sage grouse leks will remain in effect. Exceptions for raptor and/or Bald Eagle stipulations will be sought on an individual basis by the Proponent wishing to conduct operations and will be addressed through Voluntary Best Management Practices (BMP’s) and in coordination with the U.S. Fish and Wildlife Service (USFWS). Permitting mitigation alternatives outlined below will be implemented.

**Proponent Committed Measures**

The Proponents' commitments for wildlife and habitat mitigation are designed to offset impacts resulting from their development activities within the PAPA, and center on: avoiding impacts; minimizing impacts; rectifying, repairing, rehabilitating, or restoring environmental conditions; reducing or eliminating impacts over time; and compensating for impacts on-site or off-site. As outlined under the National Environmental Policy Act (NEPA), 40 CFR 1508.20:

Avoidance of Impact: "Avoiding the impact altogether by not taking a certain action or parts of an action."

- The Proponents will make efforts to avoid the impacts that could otherwise occur if development was implemented pursuant to the 2000 PAPA ROD. Proponents propose to use directional drilling on larger multi-well pads in consolidated development areas year round. Under a No Action alternative, operators could require up to 839 new pads (with additional NEPA analysis) to develop 4,399 new wells. The Proposed Action will require 253 new pads to develop the 4,399 new wells. The year round access development proposal utilizes a total of 601 pads for natural gas development including some possible downspacing to 20, 10 and 5 acre down-hole well density. The No Action total is 1,187 pads. The Proposed Action provides about a 50% percent reduction in total pads. Thirty or more wells may be developed from a single pad in some areas. The 2000 PAPA ROD analyzed wells at 40-acre spacing and limited active pads to 700 pads.
- The arrangement of the consolidated areas will leave large, contiguous blocks of land without active development activities. The estimated total disturbed acreage (without reclaimed acreage calculated into the number) will leave 92% of the PAPA undisturbed by natural gas development. An example of CDA development:



1. Conduct appropriate raptor surveys before commencement of ground disturbing activities within 1 mile of proposed disturbance to determine status of known nests and roosts and to identify new nests and roosts.
2. Monitor any activities that may adversely impact bald eagles and other raptor species.
3. Restrict activities within 0.5 mile of active raptor nests (1 mile of active bald eagle and ferruginous hawk nests) from the period of early courtship through the fledging of chicks (generally from February 1 to August 15). With assistance from the USFWS, modifications to protective buffers may be considered when topography, vegetation and other variables serve as natural protective buffers.
4. Restrict activities within 1 mile of known bald eagle winter roosts from November 1 to April 1, when activity has been verified. With assistance from the USFWS, modifications to the 1-mile protective buffer may be considered when topography, vegetation and other variables serve as natural protective buffers.
5. In coordination with the USFWS noise reduction barriers may be used to minimize disturbance when activities are proposed within an established protective buffer.
6. Prohibit activities that produce extremely loud noises within 1 mile of active bald eagle nests during nesting periods unless greater tolerance to the activity (or similar activity) has been demonstrated by the particular pair of bald eagles through monitoring.
7. Build all power lines to standards identified in Avian Power Line Interaction Committee and utilize industry-accepted standards to prevent raptors from being electrocuted on towers and poles.
8. To preclude bald eagles or other raptors from nesting on human-made structures such as cell phone towers and condensate tanks and to avoid impeding operation or maintenance activities, install anti-perching devices on structures to discourage use by raptors. Additionally, in coordination with the USFWS and based on appropriate ecosystem management, construct artificial nesting platforms to encourage nesting away from human activity.
9. As necessary, notify the appropriate authorities (Wyoming Department of Transportation on Highways and WGFD or BLM on rural and county roads) of the presence of roadside carrion and ask that they remove the carrion as soon as possible. Carcasses may be covered in the interim to discourage scavenging by bald eagles and other raptors, but only authorized personnel may touch or remove the carcasses.
10. When possible, include the USFWS in on-site reviews for future project sites.
11. The Proponents will work to identify voluntary opportunities to conserve and/or improve natural resources in the area to promote a positive land ethic.

Maintain adequate buffer from riparian habitats where possible (outside edge of trees as area of effect). Buffers would be site specific depending on vegetation and topography. They will be developed in coordination with qualified biologists, the USFWS and/or the BLM as necessary. Proponents will strive to conserve potential nesting, roosting and foraging habitat whenever possible by retaining mature trees and old growth stands wherever possible, particularly within 0.5 mile of water.

Minimize Impacts: “Minimizing impacts by limiting the degree or magnitude of the action and its implementation.”

- All activities will be conducted in such a manner that minimizes impacts on wildlife, habitat and the local communities.
- The Proponents will minimize the total area of surface disturbance and associated areas of indirect habitat loss by reducing to the extent possible human presence and activity.
  1. The Proponents will utilize liquids gathering systems and centralized processing and storage facilities where feasible thereby reducing traffic.
  2. The Proponents will utilize computer assisted remote monitoring of producing wells, and anticipate an average of only 1 roundtrip per day to each well pad during production.
  3. In addition to minimizing surface disturbance by restricting activities to existing roads, traffic on those roads will also be minimized to the extent practical by coordinating and scheduling the transportation routes and use of the roads by project personnel and service contractors.
  4. Commuting traffic will be minimized in crucial big game winter range and sage grouse winter concentration areas by bussing rig crews from staging areas to work areas.
  5. Total acreage disturbance by 2024, without reclamation considered, is estimated at 14,961 leaving 92% of the PAPA undisturbed.
- The Proponents will make efforts to reduce the total duration of project activities in the PAPA.
  1. The areas of concentrated simultaneous drilling, completion, construction, and production activities will be completed in as short a time as possible by completely drilling and completing all wells on a pad as feasible prior to moving development activities to another pad.
- Development (drilling, and completion activities) within the core area (48.36 square miles) will be concentrated to a maximum of 19 square miles in the three development areas which is 39.29% of the core acreage, leaving 60.71% of the core available for wildlife. This will result in leaving the greatest amount of undisturbed habitat as possible at any point in time in the best combination of the following:



- largest area
  - largest contiguous blocks
  - best functional connectivity
  - highest quality
- The Proponents' implementation of a road management plan, which voluntarily restricts their activities to existing roads where possible, will reduce surface disturbance and expansion of human disturbance into new areas and will lessen road mileage by 70% as compared to traditional non-concentrated, single-well pad development.
- The Proponents will plan their activities to avoid to the extent practical moving drill rigs in crucial big game winter range after November 15 and before May 1, thereby reducing the number of trucks, equipment and associated traffic during big game stipulations.
- Each year, the specific areas of concentrated activities will be determined through joint review of Proponent development plans. The Proponents (combined or separate as appropriate), BLM, and WGFD will work to reach agreement on the final plans as early in the calendar year as possible to allow sufficient time to plan, permit, and execute new construction as required in the summer months for the next activity year.
- The Proponents will also provide a 10-year rolling forecast of PAPA activity at the same time each year to fully describe the future development plans on an ongoing basis.
- Each year, the Proponents will collaborate as appropriate seeking opportunities to adjust the size of the areas required for concentrated activities and reduce impacts. The Proponents, BLM, and WGFD will jointly seek improvements to the annual and 10-year development plans designed to further reduce potential project impacts.
- The Proponents may choose any or all of the following BMP's as voluntary measures which can be used to minimize disturbance to bald eagles and other raptors when oil and gas development activities occur within recommended protective buffers.
  1. During night operations, direct lighting toward the pad to avoid light disturbance to surrounding areas if no negative pad safety impact is foreseen.
  2. Reduce unnecessary traffic and encourage travel times to be during daylight hours between 9-3.
  3. In areas within 1 mile of active nests where there is line of sight from active nests to the activity, pipeline installation equipment shall be shielded from the affected area with camouflage netting.
  4. Avoid potentially disruptive activities or permanent above ground structures in the bald eagles' direct flight path between their nest and roost sites and important foraging areas.

Restoration of Impacts: “Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.”

- Mitigation measures will begin immediately or as soon as practical, to avoid any lag time between impacts that decrease habitat function and the on-the-ground mitigation actions that increase habitat function. Mitigation in the form of interim reclamation (utilizing native cool-season grasses, forbs, and shrubs in the seed mix) will proceed as soon as practical after development drilling, completion and construction activities are completed on individual pads, which will reduce the net surface disturbance as development proceeds. Beginning in 2008, once all drilling and completion work has been finished and all wells on the pad are on production, the Proponents forecast that 70% of the disturbed pad area will be reclaimed on individual pads containing pits, and 50% of the disturbed pad area will be reclaimed on pads developed without reserve pits. The Proponents will also temporarily reclaim pads when no forecasted drilling or completion activity is expected on the pad for the following two years.
- Impacts will be mitigated by developing coordinated mitigation approaches with the BLM, WGFD, and other federal and state agencies to seek opportunities to further benefit wildlife.
- Key habitats and habitat components, such as crucial winter ranges, migration routes, sage grouse seasonal habitats, and identified sensitive species habitats, will receive first consideration for mitigation. Specific mitigation actions will as much as possible:
  - occur on-site, or immediately adjacent to impacts
  - address the same animals or species that are being impacted
  - address the same habitat components that are being impacted

Reduction and Elimination of Impacts: “Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.”

- The Proponents have committed to utilizing liquids gathering systems and centralized processing and storage facilities where feasible. Liquids gathering systems and centralized facilities will significantly reduce tanker truck traffic, most notably after the project construction phase.
- The Proponents will utilize computer assisted remote monitoring of producing wells. Proponents anticipate 1 field operator visit per day per pad.
- Proponents will use existing roads where possible which will reduce surface disturbance and expansion of human disturbance into new areas and will lessen road mileage by 70% compared to traditional non-concentrated, single-well pad development.

Compensation for Impacts: “Compensating for the impact by replacing or providing substitute resources or environments.”

- The Proponents have agreed to a 3:1 acre off-site mitigation ratio in the event that off-site mitigation is required to compensate for loss of on-site habitat (i.e., for every acre of long-term on-site habitat disturbed by the project, Proponents will improve three acres off-site habitat). This would supersede existing Questar commitments for off-site mitigation as identified in Decision Records for Questar’s existing over-winter development proposals (BLM 2004 [*Finding of No Significant Impact, Decision Record and Environmental Assessment for the Questar Year-Round Drilling Proposal, Sublette County, Wyoming*], and BLM 2005 [*Finding of No Significant Impact, Decision Record and Environmental Assessment for the Questar Year-Round Drilling Addendum, Sublette County, Wyoming*]).
- The Proponents commit to developing a comprehensive off-site mitigation plan within one year of SEIS ROD release. Options that may be included in the plan are enhancing habitat on land contiguous to the PAPA and acquisition of property rights (leasehold interest, short-term or long-term conservation easements, etc.) designed to set aside habitats, protect key migration routes and preserve open space.
- Off-site mitigation will generally be implemented if on-site actions are not considered adequate, or if off-site measures are considered to be of significantly greater value. Off-site mitigation would occur as close to the impacted area as possible, and provide habitat for the specific animals being displaced or experiencing habitat declines as a result of development. Off-site mitigation that occurs farther away would provide a key year-round life requirement for the animals that occupy the development area during part of the year.
- To assure implementation and use of effective monitoring efforts and mitigation options, annual mitigation planning for wildlife and habitats will be coordinated among BLM, WGFD, and the Proponents. The Proponents, BLM and WGFD will jointly seek improvements to the proposed development plans to further reduce project impacts.
- The Proponents would support formation of a dedicated multi-agency management team to plan and implement permitting, monitoring, mitigation, and reclamation activities. This will benefit both the Proponents and agencies by streamlining the development process, providing continual focus on plan implementation, and providing coordination and cost-efficiencies with other adjacent developments that could impact some of the same animals and habitats impacted by this project.
- The Proponents will monitor mitigation measures to determine mitigation effectiveness and provide ongoing information and direction for future mitigation efforts during the life of the field.
- The Proponents will commission and fund a habitat inventory of the PAPA. Habitat inventory data will be used for development, reclamation, and potential habitat improvement planning for key habitats and habitat components. Habitat improvements may be applied in important habitats to restore degraded or lost habitat functions.

- Concurrent with and complementing these on-site efforts to avoid, minimize and mitigate impacts, the Proponents have commissioned and funded wildlife research, wildlife monitoring and other special studies. The first year of a five year study on pronghorn antelope is now complete as is the first year of a five year research project on sage grouse. The mule deer study is in its sixth year of a seven year research and monitoring project.
- The Proponents will promote communication with other stakeholders as mitigation objectives and approaches are being developed. Specific wildlife and habitat mitigation objectives and actions should, as much as possible, be designed to minimize impacts to other important area resources (e.g., livestock, recreation, visual resources).